

SEQUENCE LISTING

<110> API Corporation

<120> A method for the production of optically active alcohols and  
carboxylic acids

<130> A51051A

<160> 13

<210> 1

<211> 345

<212> PRT

<213> Issatchenkia scutulata

<400> 1

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1 5 10 15

Leu His Ile Ile Asp Asn Leu Leu Ser Lys Gly Tyr Ser Val Ile Gly

20 25 30

Thr Ala Arg Ser Gln Ser Lys Tyr Gln Pro Ile Leu Asp Ala Phe Lys

35 40 45

Lys Lys Tyr Pro Asp Ala Asn Leu Thr Phe Glu Val Val Pro Asp Ile

50 55 60

Ser Thr Glu Asn Ala Phe Asp Asp Val Leu Lys Lys His Pro Glu Ile

65 70 75 80

Thr Ala Val Leu His Thr Ala Ser Pro Phe Ser Phe Gly Leu Asn Lys

85 90 95

Asp Leu Lys Glu Ala Tyr Leu Lys Pro Ala Val Asp Gly Thr Leu Asn

100 105 110

Ile Leu Lys Ala Ile Glu Lys Tyr Ala Pro Gln Val Thr Lys Val Val

115 120 125

Ile Thr Ser Ser Tyr Ala Ala Ile Met Thr Gly Asn Pro Ser His Val  
 130 135 140  
 His Thr Ser Glu Thr Trp Asn Pro Ile Asn Trp Glu Asn Asp Val Lys  
 145 150 155 160  
 Asn Glu Tyr Phe Ala Tyr Ile Ala Ser Lys Thr Tyr Ala Glu Lys Ala  
 165 170 175  
 Ala Arg Asp Phe Val Lys Glu His Lys Val Asn Phe Lys Leu Ala Thr  
 180 185 190  
 Val Asn Pro Pro Tyr Val Leu Gly Pro Gln Leu Phe Asp Phe Ser Val  
 195 200 205  
 Gly Pro Val Leu Asn Thr Ser Asn Gln Leu Ile Thr Asp Ala Thr Lys  
 210 215 220  
 Ile Asp Lys Asn Ser Thr Lys Pro Glu Leu Gly Thr Pro Ala Leu Ala  
 225 230 235 240  
 Val Asp Val Arg Asp Val Ala Ala Phe His Val Leu Pro Leu Glu Asp  
 245 250 255  
 Asp Lys Val Ala Ser Glu Arg Leu Phe Ile Val Ala Gly Pro Ala Val  
 260 265 270  
 Val Gln Thr Phe Leu Asn Ile Ile Asn Glu Asn Ile Pro Glu Leu Lys  
 275 280 285  
 Gly Lys Val Ala Leu Gly Asp Pro Ala Ser Glu Lys Glu Leu Ile Glu  
 290 295 300  
 Lys His Thr Asp Lys Tyr Asp Leu Thr Asn Leu His Asn Val Ile Gly  
 305 310 315 320  
 Lys Tyr Asp Phe Ile Pro Val Glu Lys Ser Val Val Asp Val Leu Glu  
 325 330 335  
 Gln Tyr Tyr Lys Ile Asn Lys Ile Asp

340

345

&lt;210&gt; 2

&lt;211&gt; 1038

&lt;212&gt; DNA

<213> *Issatchenkia scutulata*

&lt;400&gt; 2

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gtccctgaca tctccactga aaacgcattc gatgatgttt tgaagaagca tccagaaatt 240
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gatgcgacta aaattgataa gaactctact aagccggaat taggtacacc agctttagca 720
gtcgatgtta gagatgttgc tgcgttccat gttttaccat tggaagatga taaagttgca 780
agtgaagat tatttattgt tgctgggtcca gcagttgttc aaacattctt aaacatcatc 840
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gagttgattg aaaagcacac agataagtat gatttgacaa atcttcacaa cgttattggt 960
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&lt;210&gt; 3

&lt;211&gt; 344

&lt;212&gt; PRT

<213> *Saccharomyces cerevisiae*

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Val Arg Ser His Glu Lys Glu Ala Lys Leu Leu Arg Gln Phe Gln His  
35 40 45  
Asn Pro Asn Leu Thr Leu Glu Ile Val Pro Asp Ile Ser His Pro Asn  
50 55 60  
Ala Phe Asp Lys Val Leu Gln Lys Arg Gly Arg Glu Ile Arg Tyr Val  
65 70 75 80  
Leu His Thr Ala Ser Pro Phe His Tyr Asp Thr Thr Glu Tyr Glu Lys  
85 90 95  
Asp Leu Leu Ile Pro Ala Leu Glu Gly Thr Lys Asn Ile Leu Asn Ser  
100 105 110  
Ile Lys Lys Tyr Ala Ala Asp Thr Val Glu Arg Val Val Val Thr Ser  
115 120 125  
Ser Cys Thr Ala Ile Ile Thr Leu Ala Lys Met Asp Asp Pro Ser Val  
130 135 140  
Val Phe Thr Glu Glu Ser Trp Asn Glu Ala Thr Trp Glu Ser Cys Gln  
145 150 155 160  
Ile Asp Gly Ile Asn Ala Tyr Phe Ala Ser Lys Lys Phe Ala Glu Lys  
165 170 175  
Ala Ala Trp Glu Phe Thr Lys Glu Asn Glu Asp His Ile Lys Phe Lys  
180 185 190  
Leu Thr Thr Val Asn Pro Ser Leu Leu Phe Gly Pro Gln Leu Phe Asp

195	200	205
Glu Asp Val His Gly His Leu Asn Thr Ser Cys Glu Met Ile Asn Gly		
210	215	220
Leu Ile His Thr Pro Val Asn Ala Ser Val Pro Asp Phe His Ser Ile		
225	230	235
Phe Ile Asp Val Arg Asp Val Ala Leu Ala His Leu Tyr Ala Phe Gln		
245	250	255
Lys Glu Asn Thr Ala Gly Lys Arg Leu Val Val Thr Asn Gly Lys Phe		
260	265	270
Gly Asn Gln Asp Ile Leu Asp Ile Leu Asn Glu Asp Phe Pro Gln Leu		
275	280	285
Arg Gly Leu Ile Pro Leu Gly Lys Pro Gly Thr Gly Asp Gln Val Ile		
290	295	300
Asp Arg Gly Ser Thr Thr Asp Asn Ser Ala Thr Arg Lys Ile Leu Gly		
305	310	315
Phe Glu Phe Arg Ser Leu His Glu Ser Val His Asp Thr Ala Ala Gln		
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Ile Leu Lys Lys Glu Asn Arg Leu		

340

<210> 4

<211> 18

<212> PRT

<213> Issatchenkia scutulata

<400> 4

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Asp Ile

<210> 5

<211> 15

<212> PRT

<213> Issatchenkia scutulata

<400> 5

Val Val Ile Thr Ser Ser Tyr Ala Ala Ile Met Thr Gly Asn Pro

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<210> 6

<211> 23

<212> DNA

<213> Artificial

<220>

<223> PCR primer

<220>

<221> misc\_feature

<222> (3)..(3)

<223> n; inosine

<220>

<221> misc\_feature

<222> (6)..(6)

<223> n; inosine

<220>

<221> misc\_feature

<222> (15)..(15)

<223> n; inosine

<220>

<221> misc\_feature

<222> (18).. (18)

<223> n; inosine

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<210> 7

<211> 26

<212> DNA

<213> Artificial

<220>

<223> PCR primer

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<221> misc\_feature

<222> (6).. (6)

<223> n; inosine

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<222> (9).. (9)<223> n; inosine

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<222> (18).. (18)

<223> n; inosine

<220><221> misc\_feature

<222> (21).. (21)

<223> n; inosine

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<210> 8

<211> 341

<212> DNA

<213> Issatchenkia scutulata

<400> 8

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agttgtccct gacatctcca ctgaaaacgc attcgatgat gttttgaaga agcatccaga 180
aattactgct gtccttcaca cagcatctcc attctctttt ggtttgaaca aggatctgaa 240
ggaagcatat ttgaagcctg ccgttgatgg tactttgaat attctcaagg caattgagaa 300
gtatgcacca caggttacta aagttgttat cacatcttct t 341
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<210> 9

<211> 28

<212> DNA

<213> Artificial

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<211> 31

<212> DNA

<213> Artificial

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<213> Issatchenkia scutulata

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Met

1

tcg aac aaa aca gtt cta gtc acc ggg gct acc ggt ttt att gca cta 105

Ser Asn Lys Thr Val Leu Val Thr Gly Ala Thr Gly Phe Ile Ala Leu

5

10

15

cac atc att gat aat tta ttg tct aag ggt tat tcc gtt att ggt aca 153

His Ile Ile Asp Asn Leu Leu Ser Lys Gly Tyr Ser Val Ile Gly Thr

20

25

30

gct aga tcc caa tct aaa tat caa cca atc ctt gat gct ttc aag aaa 201

Ala Arg Ser Gln Ser Lys Tyr Gln Pro Ile Leu Asp Ala Phe Lys Lys

35

40

45

aaa tac cct gat gca aat ttg act ttt gaa gtt gtc cct gac atc tcc 249

Lys Tyr Pro Asp Ala Asn Leu Thr Phe Glu Val Val Pro Asp Ile Ser

50

55

60

65

act gaa aac gca ttc gat gat gtt ttg aag aag cat cca gaa att act 297

Thr Glu Asn Ala Phe Asp Asp Val Leu Lys Lys His Pro Glu Ile Thr

70

75

80

gct gtc ctt cac aca gca tct cca ttc tct ttt ggt ttg aac aag gat 345

Ala Val Leu His Thr Ala Ser Pro Phe Ser Phe Gly Leu Asn Lys Asp	
85 90 95	
ctg aag gaa gca tat ttg aag cct gcc gtt gat ggt act ttg aat att	393
Leu Lys Glu Ala Tyr Leu Lys Pro Ala Val Asp Gly Thr Leu Asn Ile	
100 105 110	
ctc aag gca att gag aag tat gca cca cag gtt act aaa gtt gtt atc	441
Leu Lys Ala Ile Glu Lys Tyr Ala Pro Gln Val Thr Lys Val Val Ile	
115 120 125	
aca tct tct tat gct gca att atg aca ggt aat cca agt cat gtc cac	489
Thr Ser Ser Tyr Ala Ala Ile Met Thr Gly Asn Pro Ser His Val His	
130 135 140 145	
acc agt gaa acc tgg aac cca att aat tgg gaa aac gat gtg aag aat	537
Thr Ser Glu Thr Trp Asn Pro Ile Asn Trp Glu Asn Asp Val Lys Asn	
150 155 160	
gaa tac ttt gca tat att gcc tcc aag acg tat gct gaa aaa gct gcg	585
Glu Tyr Phe Ala Tyr Ile Ala Ser Lys Thr Tyr Ala Glu Lys Ala Ala	
165 170 175	
aga gat ttt gtc aag gag cat aag gtc aat ttc aag tta gca act gtt	633
Arg Asp Phe Val Lys Glu His Lys Val Asn Phe Lys Leu Ala Thr Val	
180 185 190	
aac cca cca tac gtt ctg ggt cca caa tta ttt gac ttc tca gtt ggt	681
Asn Pro Pro Tyr Val Leu Gly Pro Gln Leu Phe Asp Phe Ser Val Gly	
195 200 205	
cca gtc ttg aac act tcc aac caa ttg atc acg gat gcg act aaa att	729
Pro Val Leu Asn Thr Ser Asn Gln Leu Ile Thr Asp Ala Thr Lys Ile	
210 215 220 225	
gat aag aac tct act aag ccg gaa tta ggt aca cca gct tta gca gtc	777

Asp Lys Asn Ser Thr Lys Pro Glu Leu Gly Thr Pro Ala Leu Ala Val  
                             230                            235                            240  
 gat gtt aga gat gtt gct gcg ttc cat gtt tta cca ttg gaa gat gat 825  
 Asp Val Arg Asp Val Ala Ala Phe His Val Leu Pro Leu Glu Asp Asp  
                             245                            250                            255  
 aaa gtt gca agt gaa aga tta ttt att gtt gct ggt cca gca gtt gtt 873  
 Lys Val Ala Ser Glu Arg Leu Phe Ile Val Ala Gly Pro Ala Val Val  
                             260                            265                            270  
 caa aca ttc tta aac atc atc aac gag aac att cca gaa ctt aaa ggt 921  
 Gln Thr Phe Leu Asn Ile Ile Asn Glu Asn Ile Pro Glu Leu Lys Gly  
                             275                            280                            285  
 aag gtt gcc cta gga gat cca gct tca gag aag gag ttg att gaa aag 969  
 Lys Val Ala Leu Gly Asp Pro Ala Ser Glu Lys Glu Leu Ile Glu Lys  
                             290                            295                            300                            305  
 cac aca gat aag tat gat ttg aca aat ctt cac aac gtt att ggt aaa 1017  
 His Thr Asp Lys Tyr Asp Leu Thr Asn Leu His Asn Val Ile Gly Lys  
                             310                            315                            320  
 tat gat ttc att cca gtt gaa aag tcc gtt gtc gac gtc tta gaa caa 1065  
 Tyr Asp Phe Ile Pro Val Glu Lys Ser Val Val Asp Val Leu Glu Gln  
                             325                            330                            335  
 tat tac aaa atc aat aaa att gat tag tttatataga aaattttata 1112  
 Tyr Tyr Lys Ile Asn Lys Ile Asp  
                             340                            345  
 gctaaaggcc gaatcaactt ctttcttctt cttcaaaaaa aaaaaaaaaa aaaaaaaaaa 1172  
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1212  
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<212> DNA

<213> Artificial

<220>

<223> PCR primer

<400> 12

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<210> 13

<211> 38

<212> DNA

<213> Artificial

<220>

<223> PCR primer

<400> 13

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